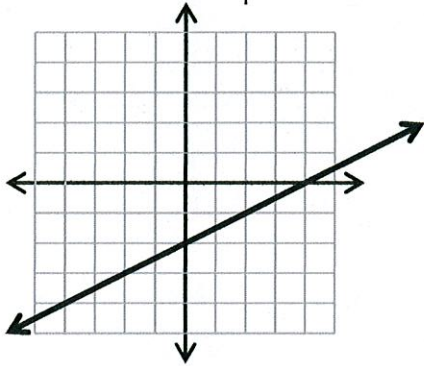


# Day 1: Graphing Equations of Lines & Function Notation

SLOPE INTERCEPT FORM OF A LINE:  $y = mx + b$

What is the equation of the line in the graph displayed below:



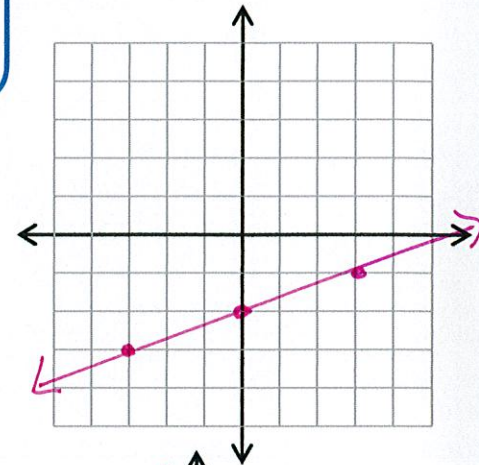
Slope:  $\frac{2}{4} = \frac{1}{2}$  Y-Intercept:  $(0, -2)$   
Equation:  $y = \frac{1}{2}x - 2$

Write the slope as a fraction & y-intercept as a point!

Let's graph the equation  $y = \frac{1}{3}x - 2$

Slope:  $\frac{1}{3}$  Y-Intercept:  $(0, -2)$

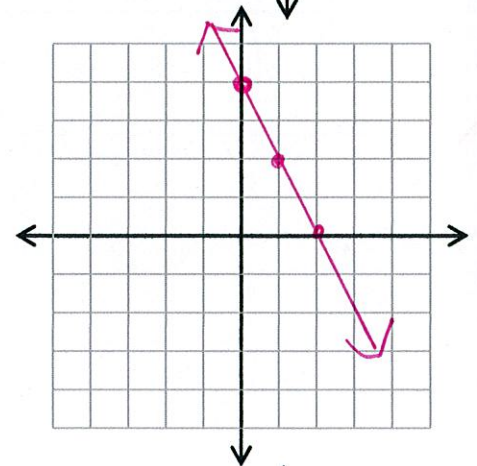
Domain:  $(-\infty, \infty)$  Range:  $(-\infty, \infty)$



Let's graph the equation  $y = -2x + 4$ .

Slope:  $-\frac{2}{1}$  Y-Intercept:  $(0, 4)$

Domain:  $(-\infty, \infty)$  Range:  $(-\infty, \infty)$

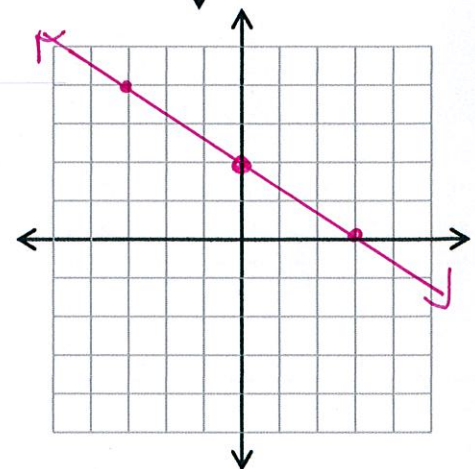


Let's graph the equation  $2x + 3y = 6$ .  $\frac{3y}{3} = \frac{-2x + 6}{3}$

Remember it MUST be in slope intercept form in order to graph!

Slope:  $-\frac{2}{3}$  Y-Intercept:  $(0, 2)$

Domain:  $(-\infty, \infty)$  Range:  $(-\infty, \infty)$

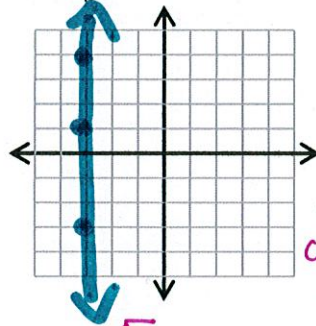


Slope intercept form:  $y = -\frac{2}{3}x + 2$

Let's practice putting equations in slope-intercept form (SOLVE FOR Y!!). Then state the slope and y-intercept.

$y - 10 = 3x$ $y = 3x + 10$ Slope: $\frac{3}{1}$ Y-Intercept: $(0, 10)$	$3x - 4y = 12$ $\frac{-4y}{-4} = \frac{-3x + 12}{-4}$ $y = \frac{3}{4}x - 3$ Slope: $\frac{3}{4}$ Y-Intercept: $(0, -3)$	$-2x - 7y = 14$ $\frac{-7y}{-7} = \frac{2x + 14}{-7}$ $y = -\frac{2}{7}x - 2$ Slope: $-\frac{2}{7}$ Y-Intercept: $(0, -2)$
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Graph a Vertical line



Find 3 points on your line:

$(-3, 1)$   $(-3, 3)$   
 $(-3, 4)$

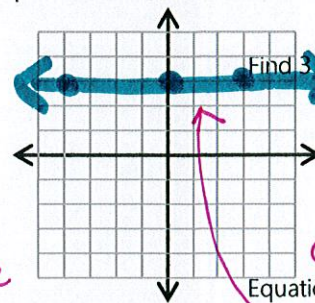
WHAT DO YOU SEE?

all x values are the same

Equation of your line:

$x = -3$

Graph a Horizontal line:



Find 3 points on your line:

$(0, 3)$   $(3, 3)$   
 $(-4, 3)$

WHAT DO YOU SEE?

all the y values are the same

Equation of your line:

$y = 3$

Using FUNCTION NOTATION

Output value

Input value

$$f(x) = 5x + 3$$

f of x equals 5 times x plus 3.

$$y = f(x)$$

Output

Name of Function

Input

Given $f(x) = x^2 - 2$ , find: $f(5) = (5)^2 - 2$ $= 25 - 2$ $= 23$ $f(-5) = (-5)^2 - 2$ $= 25 - 2$ $= 23$ $f(0) = (0)^2 - 2$ $= 0 - 2$ $= -2$	Given $g(x) = 2x + 7$ , find: $g(4) = 2(4) + 7$ $= 8 + 7$ $= 15$ $g(-4) = 2(-4) + 7$ $= -8 + 7$ $= -1$ $g(a) = 2(a) + 7$ $= 2a + 7$	Given $h(x) = -2x^2 + 7x - 11$ , find: $h(2) = -2(2)^2 + 7(2) - 11$ $= -2(4) + 7(2) - 11$ $= -8 + 14 - 11$ $= -5$ $h(2a) = -2(2a)^2 + 7(2a) - 11$ $= -2(4a^2) + 7(2a) - 11$ $= 8a^2 + 14a - 11$ $3h(-3) = 3[-2(-3)^2 + 7(-3) - 11]$ $= 3[-2(9) + 7(-3) - 11]$ $= 3[-18 - 21 - 11]$ $= 3[-50]$ $= -150$
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A little more of a challenge: Given  $f(x) = 2x + 1$ , find  $-4[f(3) - f(1)]$ .

$$f(3) = 2(3) + 1 = 7$$

$$-4[7 - 3]$$

$$f(1) = 2(1) + 1 = 3$$

$$-4[4]$$

$$-16$$

$$3[-18 - 21 - 11]$$

$$3[-50]$$

$$-150$$